

MINISTRY OF PUBLIC WORKS AND TRANSPORT
THE KINGDOM OF CAMBODIA

BASIC DESIGN STUDY REPORT
ON
THE PROJECT
FOR
CONSTRUCTION OF A BRIDGE OVER THE MEKONG RIVER
IN
THE KINGDOM OF CAMBODIA

JANUARY 1997

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JAPAN INTERNATIONAL COOPERATION AGENCY
NIPPON KOEI CO., LTD.

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PREFACE

In response to a request from the Government of the Kingdom of Cambodia, the Government of Japan decided to conduct a basic design study on the Project for Construction of a Bridge over the Mekong River in the Kingdom of Cambodia and entrusted the study to the Japan International Cooperation Agency (JICA).

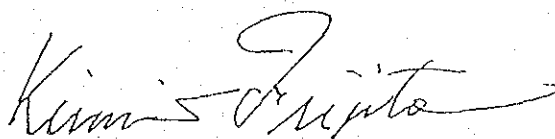
JICA sent to Cambodia a study team from 4 August to 21 August, 1996.

The team held discussions with the officials concerned of the Government of Cambodia, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to Cambodia in order to discuss a draft basic design, and as this result, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Kingdom of Cambodia for their close cooperation extended to the team.

January 1997



Kimio Fujita
President

Japan International Cooperation Agency

January 1997

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Construction of a Bridge over the Mekong River in the Kingdom of Cambodia.

This study was conducted by Nippon Koei Co., Ltd., under a contract to JICA, during the period from 16 July, 1996 to 14 January, 1997. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Cambodia and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

Finally, we hope that this report will contribute to further promotion of the project.

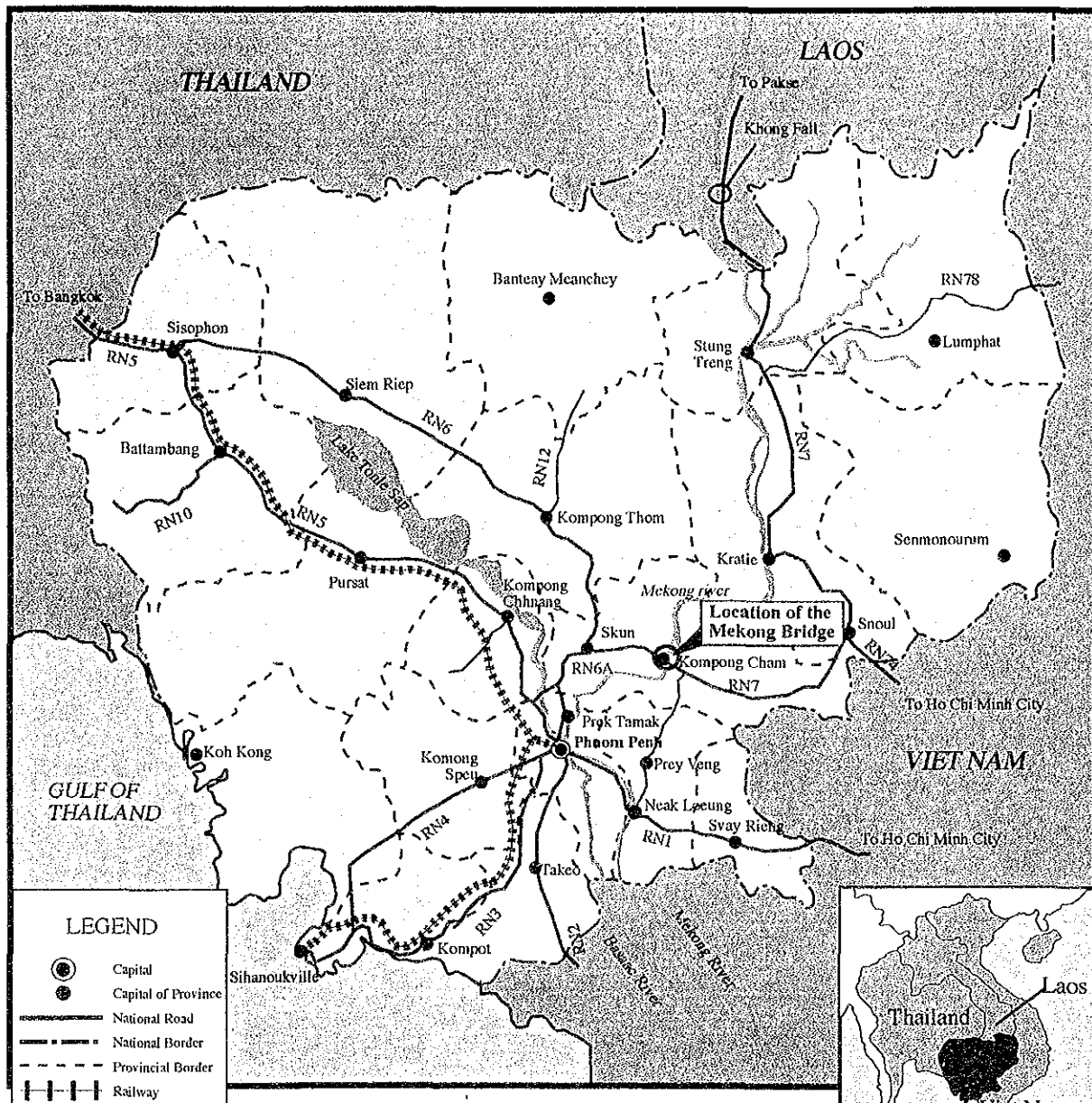
Very truly yours,



Hisashi OHSIMA
Project Manager,

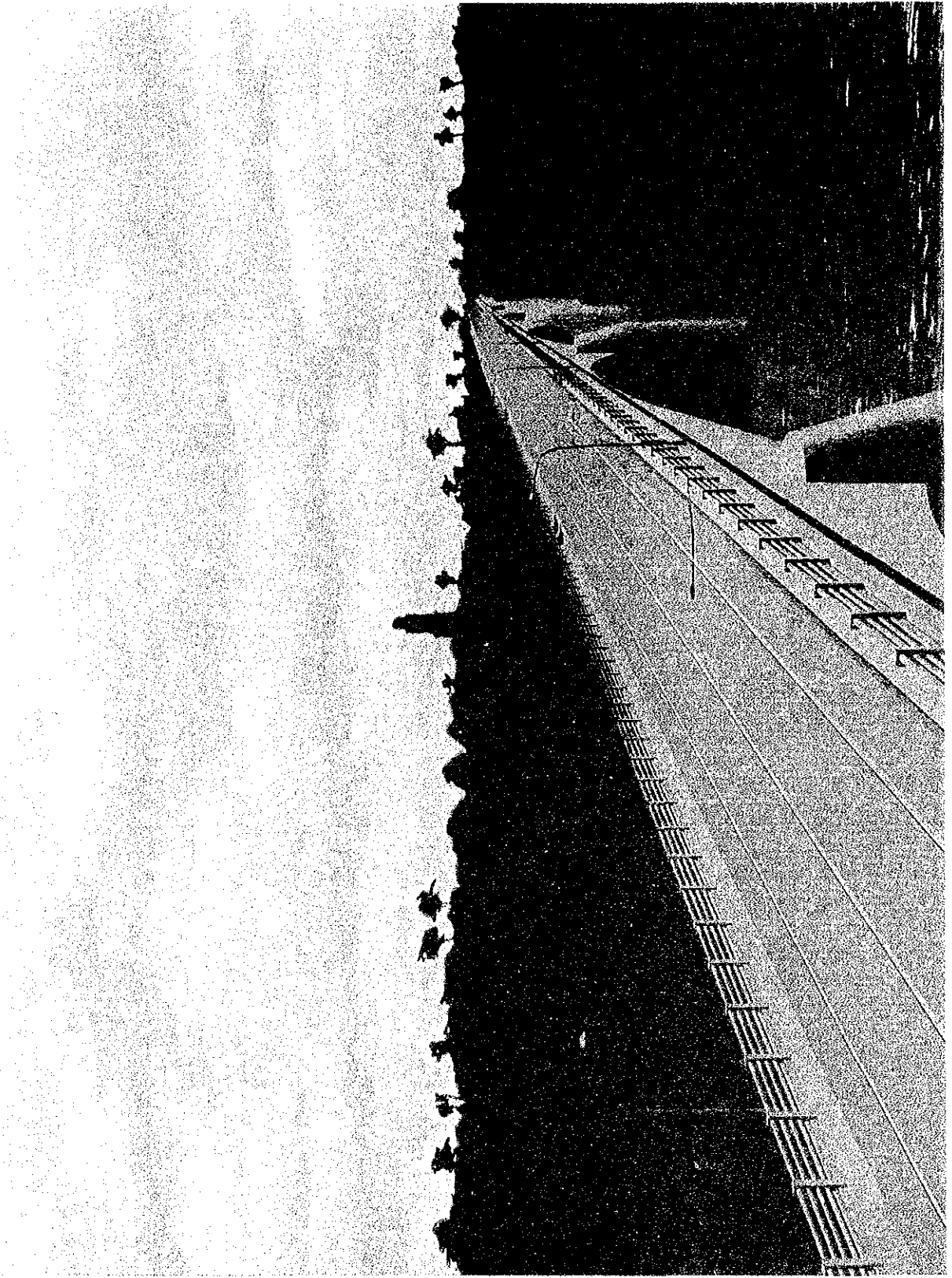
Basic Design Study Team on
The Project for Construction of
a Bridge over the Mekong River
in the Kingdom of Cambodia

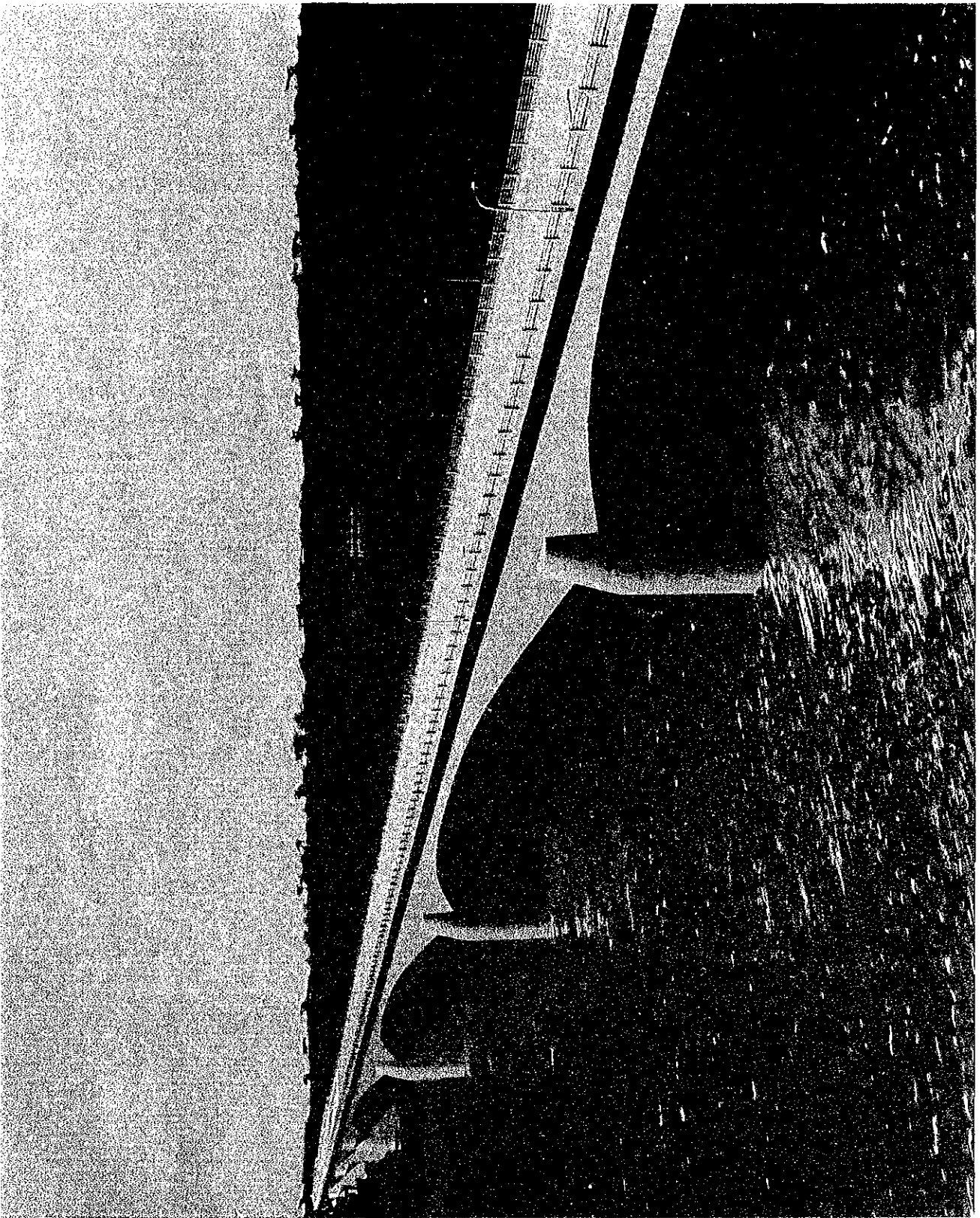
Nippon Koei Co., Ltd.

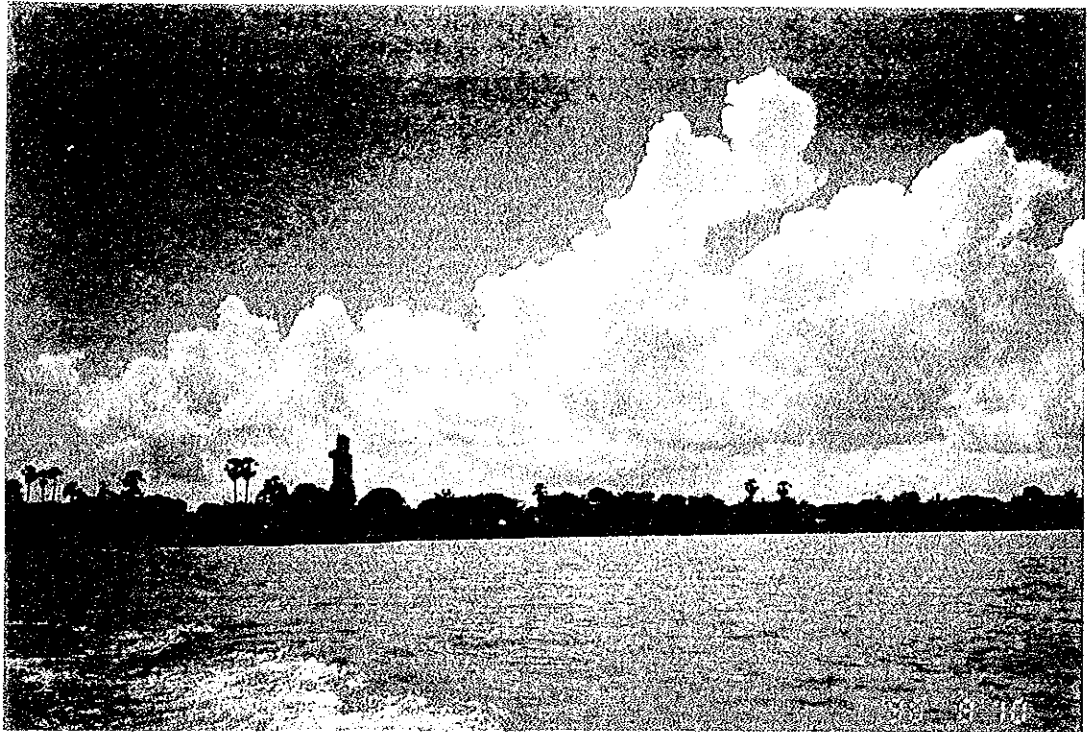


BASIC DESIGN STUDY ON THE PROJECT FOR CONSTRUCTION OF
A BRIDGE OVER THE MEKONG RIVER IN THE KINGDOM OF CAMBODIA

LOCATION MAP



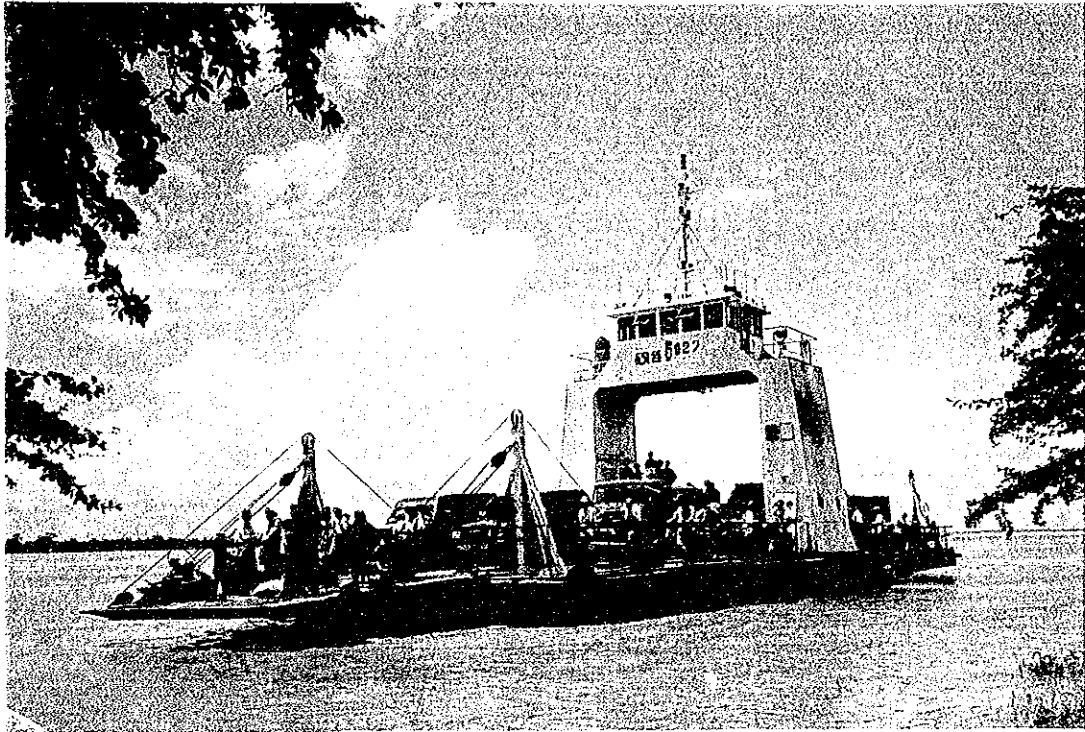




Location of Bridge (East Side of Kompong Cham)



Junction between existing Root 7 and New Road of This Project



Operating Ferry Boat at Kompong Cham



New Ferry Station to be relocated at Kompong Cham Side



Group of Overloaded Trucks carrying Timber(Root 6)



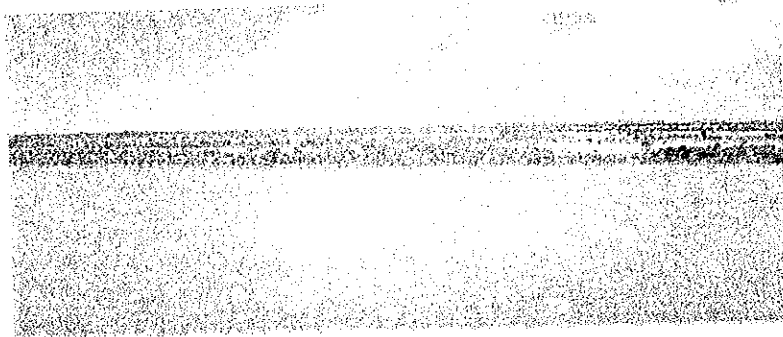
Overloaded Trucks(Root 6)



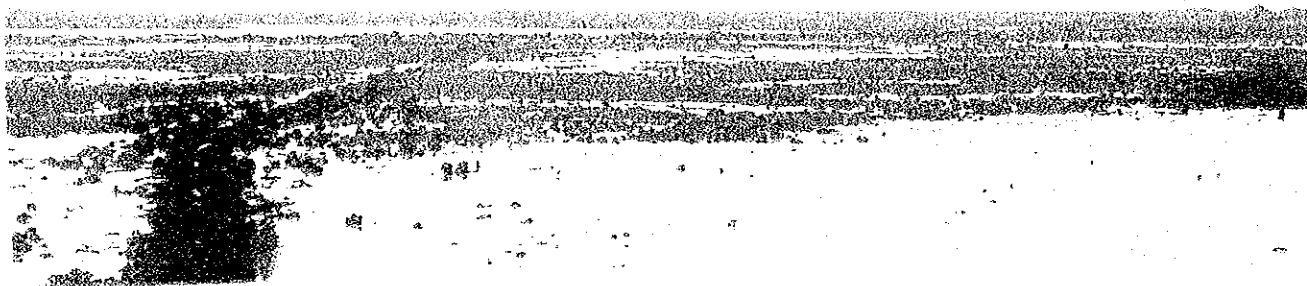
Remains of Flooding of West Side of Kompong Cham(1996 September)



Remains of Flooding of East Side of Kompong Cham(1996 September)



State of Flooding at East Side of Kompong Cham (taken in 6 October 1996)



State Of Flooding at East Side of Root 7 (taken in October 1996)



State of Flooding at East Side of Root 7 near the Bridge away from Mekong River about 5 km(taken in October 1996)

ABBREVIATIONS

AC	-	Asphalt Concrete
ADB	-	Asian Development Bank
BHN	-	Basic Human Need
CIF	-	Cost, Insurance & Freight
DANIDA	-	Danish International Development Agency
EIA	-	Environmental Impact Assessment
EIRR	-	Economic Internal Rates of Return
ESCAP	-	Economic and Social Commission for Asia and the Pacific
F/S	-	Feasibility Study
FAO	-	Food and Agricultural Organization
GDP	-	Gross Domestic Product
GNP	-	Gross National Product
IMF	-	International Monetary Fund
JICA	-	Japan International Cooperation Agency
Lao PDR	-	Lao People's Democratic Republic
MPWT	-	Ministry of Public Works and Transport
PC	-	Prestressed Concrete
RC	-	Reinforced Concrete
SEP	-	Self Elevating Platform
UN	-	United Nation
UNTAC	-	United Nation Transitional Authority in Cambodia
WB	-	World Bank

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1. BACKGROUND OF THE PROJECT

The Kingdom of Cambodia is situated at 102.40'~107.37' east longitude and 8.35'~14.40 north latitude with a area of 181,000 km² and a population of approximately 10.25 million (estimated by World Bank in 1995), bordering Vietnam, Laos and Thailand. Most of its land is composed of plain and the lake of Tonle Sap exists in the center of north-east of the country where the Mekong River flows down from the north land to the south. The low hills stretches to the area of Gulf of Siam, and border of Thailand and Vietnam. The climate of Cambodia is classified as 'Tropical Monsoon' that has dry season(June ~ November) and rainy season (November ~ May). Temperature at Phnom Penh is in the 30. C~35 C range and humidity is around 77%.

According to the Cambodian chronicles, Cambodia was invaded several times by Thai or Vietnam and then the French administration was founded in 1884. Although Cambodia declared the sovereignty in 1953, a coup d'état broke out in 1970. Since then Cambodia has faced turmoil and destruction due to the civil war in the past twenty years. However, after signing of agreement of Peace Conference held at Paris in October 1991, Cambodia was able to conduct an election for the Constituent Assembly in May 1993 with the help and supervision of the United Nations. Now, Cambodia sets forth reconstruction of its economy through an assistance by United Nations, other international organizations and assistance agencies of several countries.

Major economic activities of Cambodia are agriculture and fishery industry as the first industry that occupies about 45% of total products, and the second industry shares about 19% and the third one shows 36%. The gross domestic products in 1995 shows 2,880 million US\$ with economic growth rate of 7.6% and inflation rate of 3.5%, standing up 281US\$ per capita gross domestic products. The Government of Cambodia is implementing free economic policy since 1989, especially emphasizing market-oriented economy in the second five year economic plan commenced from 1991. On the other hand, financial situation of Cambodia seems to be fragile mainly because tax system and its collection system is not yet fully established. A total amount of external assistance reaches 215 million US\$, comparing with a total amount of revenue of 489 million US\$, in which the ratio of external assistance to revenue is 44%. The counterparts of export are Singapore, Japan and Thai, shipping timber, rubber and others. The counterparts of import are Singapore, Indonesia and Japan, importing tobacco, construction materials, petroleum products and others. However, amount of Import always exceeds that of export, then total amount of exceeded import reached about 1.10 billion yen in 1994 and about 14.6 billion yen in 1995 respectively.

In the conferences aiming at reconstruction of Cambodia such as the second international committee on the Reconstruction of Cambodia held in Tokyo in March in 1994 or the forth international conference of the road network held in Chiang Mai 1994, the Government of Cambodia submitted 'National Programme to Rehabilitate and Develop Cambodia' or 'the Economic Cooperation Programme in the Greater Mekong Subregion'.

According to 'National Programme to Rehabilitate and Develop Cambodia', at the first stage, the Government of Cambodia pointed out following objective:

- establishment of sound finance and investment law of privatization, and strengthening market economy through improvement of law systems
- modernization of country and rationalization of official work
- establishment of following infrastructure, such as agriculture, industry and sight seeing sector

The second five year economic plan indicates market economy in Cambodia, which puts its priority to economic development as follows.

- development of agriculture sector
- development of energy sector
- strengthening transportation sector
- urban redevelopment

Domestic transportation system is composed of road network with 34,000 km length, railway network with 650 km length, inland waterways with six ports, and five air ports connecting Phnom Penh. Most of roads were constructed in 1920` or 1930` with narrow width that are not suited to heavy vehicles, except R-4. Major trunk roads (R-1~R-7) radiate from Phnom Penh and roads between rural cities is not yet improved. Of these roads, paved road is 2,500 km length and remaining road is gravel or earth one. Condition of these road is extremely in bad condition due to results of inner war.

The bottle neck in road network is considered that there is no bridge crossing over the Mekong River in which transpiration is depending on ferry facility. As no bridge structure exists for the Mekong River and the Tnle Sap River except two bridges located at nearby Phnom Penh (Chroy Chang Va Bridge and Monivong Bridge), consequently means crossing river are obliged to be depending on following five ferry facilities.

- 1) Neak Loeung : R-1
- 2) Prek Tamak : R-6
- 3) Prek Kadom : R-61
- 4) Kompong Cham : R-7
- 5) Stan Tren : R-7

Another problem is considered that load carrying capacity comes to be low due to overloaded vehicles. Although the Ministry of Public Works and Transport refrains heavy vehicles with more than 20t from passing, overloaded trucks carrying timber or cement are passing over bridges and weight of these out law vehicles is estimated to be 25t ~ 30t.

According to the principal of 'National Programme to Rehabilitate and Develop Cambodia', necessity of this Project can be summarized as follows :

- 1) It is necessary to ensure rural develop together with activation of agriculture sector in order to attain justice, fair and peace in upgrading life standard of every Cambodian. Namely, product of agriculture should be strengthened through improvement of transportation means and rehabilitation of trunk road network. Especially, development of agriculture sector in north east parts of Cambodia where the Mekong River separates country from east and west part is expected to be promoted. In order to reconstruct economy of Cambodia, it is extremely important to promote market oriented economy in agricultural products through rehabilitation of transportation infrastructure, especially road sector.
- 2) Following two strategy are important to ensure trade activity through Sihanoukville port. One is to beef up transportation of goods from Sihanoukville to Phnom Penh through improvement of R-4 and development of Sihanoukville port. The other is to rehabilitate R-6 and R-7 which is connecting between Phnom Penh and Kompong Cham.
- 3) It is essential to strengthen relationship with neighboring countries to ensure sound economic development of Cambodia in improving domestic trunk road forming international road. Especially, solidarity between Laos and Cambodia is considered to be important because both countries has common identity.

Under these background, the Government of Cambodia requested the Government of Japan in October, 1993 to conduct feasibility study on the Mekong River Bridge, aiming at construction of this bridge. Japan International Cooperation Agency dispatched preliminary study team 1994, and commenced feasibility study in March, 1995. This feasibility study covered selection of the optimum bridge location among three candidate locations that is, Neak Loeung, Prek Tamak and Kompong Cham, based on technical and economic consideration. Based on wide range of study, this study concluded Kompong Cham route connecting R-7 at nearby Kompong Cham city be optimum route and this report was submitted to the Government of Cambodia by the Government of Japan. The Government of Cambodia requested Japan's Grand Aid to construct the bridge at Kompong Cham city in March, 1996. In response to this request, JICA dispatched basic design study team to Cambodia in August, 1996.

